Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in this application:

Listing of Claims:

Claims 1 – 4: (cancelled)

Claim 5: (previously presented) A method according to claim 20, wherein said performing step (b) further comprises the step of performing the negligible maneuver of between 2-20 meters per second at the WSB or the WSB orbit for ejection therefrom.

Claim 6: (cancelled)

Claim 7: (previously presented) A method according to claim 20, wherein the at least one of the WSB or the WSB orbit is realizable at the predetermined arbitrary altitude by specifying a predetermined velocity magnitude of the object, thereby defining a predetermined capture eccentricity.

Claim 8: (cancelled)

Claim 9: (previously presented) A method according to claim 20, wherein the at least one of the WSB or the WSB orbit is nonlinear and being substantially at a boundary of capture and escape, thereby allowing the capture and the escape to occur for a substantially zero or relatively small maneuver.

Claims 10 – 11:(cancelled)

Claim 12: (previously presented) A method according to claim 20, wherein a motion in the at least one of the WSB or the WSB orbit is at least one of parabolic and elliptic.

Claims 13 – 16: (cancelled)

Claim 17: (currently amended) A method of generating a transfer for an object emanating substantially at at least one of earth, earth orbit and a first heavenly location to arrive at at least one of the moon, moon orbit and a second heavenly location using a computer implemented process, comprising the steps of:

(a) entering parameters for said method of generating the transfer;

(b) implementing at least one of a forward targeting process and a forward transfer process to converge at or about the at least one of the moon, the moon [[a]]orbit and the second heavenly location; and

(c) iterating step (b) until sufficient convergence to obtain the transfer from the at least one of earth, the earth orbit and the first heavenly location to the at least one of the moon, the moon orbit and the second heavenly location.

Claim 18: (previously presented) A method of traveling from substantially from at least one of earth, earth orbit and a first heavenly location to at least one of the moon, moon orbit and a second heavenly location in a space vehicle or rocket using a transfer, comprising the steps of:

(a) generating the transfer by implementing at least one of a forward targeting process and a forward transfer process to converge at the at least one of the moon, the moon orbit and the second heavenly location; and

(b) traveling from substantially at the at least one of the earth, the earth orbit and the first heavenly location to the at least one of the moon, the moon orbit and the second heavenly location using the transfer by the space vehicle or the rocket.

Claim 19: (previously presented) A method of generating a transfer for an object emanating substantially at at least one of a first heavenly object, first heavenly object orbit and a first heavenly location to arrive at at least one of a second heavenly object, second heavenly object orbit and a second heavenly location, comprising the sequential, non-sequential or sequence independent steps of:

(a) entering parameters for said method of generating the transfer;

(b) implementing at least one of a forward targeting process and a forward transfer process by varying the parameters to converge at the at or about least one of the second heavenly object, the second heavenly object orbit and the second heavenly location from the first heavenly object, the first heavenly object orbit and the first heavenly location; and

(c) iterating step (b) until sufficient convergence to obtain the transfer from the at least one of the first heavenly object, the first heavenly object orbit and the first heavenly location to the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location.

Claim 20: (original) A method according to claim 19, wherein said iterating step (c) further comprises the step of iterating step (b) until sufficient convergence to obtain the transfer from the at least one of the first heavenly object, the first heavenly object orbit and the first heavenly location to the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location via at least one of a weak capture trajectory and a weak stability boundary (WSB) orbit interposed therebetween.

Claim 21: (original) A method according to claim 20, wherein said implementing step (b) further comprises the step of generating a trajectory with respect to the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location comprising at least a negligible maneuver of between 2-20 meters per second at the weak capture trajectory or the WSB orbit for at least one of timing and positioning of at least one of a space vehicle, satellite and rocket, prior to ejection therefrom.

Claim 22: (original) A method according to claim 19, wherein said implementing step (b) further comprises the step of implementing the at least one of the forward targeting process and the forward transfer process by varying at least two spherical parameters for convergence of the target variables at the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location, while maintaining at least one classical variable substantially fixed.

Claim 23: (original) A method according to claim 19, wherein said implementing step (b) further comprises the step of implementing the at least one of the forward targeting process and the forward transfer process by varying velocity magnitude VE, and flight path angle *E for convergence of the target variables at the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location, the target variables including radial distance, rM, and inclination iM.

Claim 24: (original) A method according to claim 23, further comprising the steps of:

(d) transforming converged values of VE, *E into classical elements;

(e) transforming the classical elements to spherical coordinates, wherein the spherical coordinates include the converged values of VE, *E, and longitude *E, latitude *E, flight path azimuth/angle with vertical *E are changed.

Claim 25: (original) A method according to claim 23, wherein the velocity magnitude VE, and the flight path angle *E are decoupled from the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location in the transfer.

Claim 26: (original) A method according to claim 23, wherein the velocity magnitude VE, and the flight path angle *E are decoupled from angular elements of the at least one of the first heavenly body, the first heavenly body orbit and the first heavenly location including inclination iE, ascending node relative to earth *E, and argument of periapsis relative to the first heavenly body *E.

Claim 27: (original) A method according to claim 19, wherein said implementing step (b) further comprises the step of implementing the at least one of the forward targeting process and the forward transfer process comprising a second order Newton algorithm, and wherein the second order Newton algorithm utilizes two control variables including velocity magnitude VE, and flight path angle *E that are varied to achieve at least one of transfer and capture conditions at the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location using two target variables including radial distance, rM, and inclination iM.

Claim 28: (original) A method according to claim 19, wherein said implementing step (b) further comprises the step of generating a trajectory around the at least one of the second heavenly body ~~or~~, the second heavenly body orbit and the second heavenly location comprising a negligible maneuver of between 2-20 meters per second at at least one of a weak stability boundary (WSB), WSB orbit and weak capture trajectory associated with the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location.

Claim 29: (original) A method according to claim 28, wherein the WSB or the WSB orbit is nonlinear and being substantially at a boundary of capture and escape, thereby allowing the capture and the escape to occur for a substantially zero or relatively small maneuver, and wherein solar gravitational perturbations influence the first and second transfers.

Claim 30: (original) A method according to claim 28, wherein the at least one of the WSB, the WSB orbit and the weak capture trajectory is substantially at a boundary of interaction between gravitational fields.

Claim 31: (original) A method according to claim 28, wherein as at least one of a space vehicle, satellite and rocket moves in at least one of the at least one of the WSB, the WSB orbit and the weak capture trajectory, a Kepler energy of the at least one of a space vehicle, satellite and rocket is slightly negative and substantially near to zero.

Claim 32: (original) A method according to claim 28, wherein the at least one of the WSB, the WSB orbit and the weak capture trajectory is realizable at the predetermined arbitrary altitude by specifying a predetermined velocity magnitude of the at least one of a space vehicle, satellite and rocket, thereby defining a predetermined capture eccentricity.

Claim 33: (original) A method according to claim 19, wherein the forward targeting process is a second order Newton algorithm.

Claim 34: (original) A method according to claim 19, wherein the first heavenly body or the first heavenly body orbit comprises earth or earth orbit, and wherein the second heavenly body or the second heavenly body orbit comprises moon or moon orbit.

Claim 35: (previously presented) A method of traveling by an object emanating substantially from at least one of a first heavenly object, first heavenly object orbit and a first heavenly location to arrive at at least one of a second heavenly object, second heavenly object orbit and a second heavenly location using a transfer, comprising the sequential, non-sequential or sequence independent steps of:

(a) generating the transfer by implementing at least one of a forward targeting process and a forward transfer process to converge at or about the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location; and

(b) traveling from substantially from the at least one of the first heavenly object , the first heavenly object orbit and the first heavenly location to the at least one of the second heavenly object, second heavenly object orbit and the second heavenly location using the transfer by the object.

Claim 36: (previously presented) A spacecraft or satellite implementing a method of traveling from substantially at least one of a first heavenly object, a first heavenly object orbit and a first heavenly location to arrive at at least one of a second heavenly object, a second heavenly object orbit and a second heavenly location using a transfer, wherein the transfer is generated via at least one of said spacecraft, said satellite and a remote system, by implementing at least one of a forward targeting process and a forward transfer process to converge at or about the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location; and said spacecraft or said satellite travel from substantially at the at least one of the first heavenly object, the first heavenly object orbit and the first heavenly location to the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location using the transfer.

Claim 37: (new) A method according to claim 19, wherein said iterating step (c) further comprises the step of iterating step (b) until sufficient convergence to obtain the transfer from the at least one of the first heavenly object, the first heavenly object orbit and the first heavenly location to the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location via at least one of a low energy transfer and a low energy orbit.

Claim 38: (new) A method according to claim 35, wherein said iterating step (c) further comprises the step of iterating step (b) until sufficient convergence to obtain the transfer from the at least one of the first heavenly object, the first heavenly object orbit and the first heavenly location to the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location via at least one of a low energy transfer and a low energy orbit.

Claim 39: (new) A method according to claim 38, wherein said implementing step (b) further comprises the step of generating a trajectory with respect to the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location comprising at least a negligible maneuver of between 2-20 meters per second at the via the at least one of the low energy transfer and the low energy orbit. for at least one of timing and positioning of at least one of a space vehicle, satellite and rocket, prior to ejection therefrom.

Claim 40: (new) A method according to claim 38, wherein said implementing step (b) further comprises the step of implementing the at least one of the forward targeting process and the forward transfer process by varying at least two spherical parameters for convergence of the target variables at the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location, while maintaining at least one classical variable substantially fixed.

Claim 41: (new) A method according to claim 38, wherein said implementing step (b) further comprises the step of implementing the at least one of the forward targeting process and the forward transfer process by varying velocity magnitude VE, and flight path angle *E for convergence of the

target variables at the at least one of the second heavenly object, the second heavenly object orbit and the second heavenly location, the target variables including radial distance, rM, and inclination iM.

Claim 42: (new) A method according to claim 41, further comprising the steps of:

(d) transforming converged values of VE, *E into classical elements;

(e) transforming the classical elements to spherical coordinates, wherein the spherical coordinates include the converged values of VE, *E, and longitude *E, latitude *E, flight path azimuth/angle with vertical *E are changed.

Claim 43: (new) A method according to claim 41, wherein the velocity magnitude VE, and the flight path angle *E are decoupled from the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location in the transfer.

Claim 44: (new) A method according to claim 41, wherein the velocity magnitude VE, and the flight path angle *E are decoupled from angular elements of the at least one of the first heavenly body, the first heavenly body orbit and the first heavenly location including inclination iE, ascending node relative to earth *E, and argument of periapsis relative to the first heavenly body *E.

Claim 45: (new) A method according to claim 38, wherein said implementing step (b) further comprises the step of implementing the at least one of the forward targeting process and the forward transfer process comprising a second order Newton algorithm, and wherein the second order Newton algorithm utilizes two control variables including velocity magnitude VE, and flight path angle *E that are varied to achieve at least one of transfer and capture conditions at the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location using two target variables including radial distance, rM, and inclination iM.

Claim 46: (new) A method according to claim 38, wherein said implementing step (b) further comprises the step of generating a trajectory around the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location comprising a negligible maneuver of at

least one of a weak stability boundary (WSB), WSB orbit, low energy transfer and weak capture associated with the at least one of the second heavenly body, the second heavenly body orbit and the second heavenly location.

Claim 47: (new) A method according to claim 46, wherein the at least one of the WSB, the WSB orbit, the low energy transfer and the weak capture is nonlinear and being substantially at a boundary of capture and escape, thereby allowing the capture and the escape to occur for a substantially zero or relatively small maneuver.

Claim 48: (new) A method according to claim 46, wherein the at least one of the WSB, the WSB orbit, the low energy transfer and the weak capture is substantially at a boundary of interaction between gravitational fields.

Claim 49: (new) A method according to claim 46, wherein as at least one of a space vehicle, satellite and rocket moves in wherein the at least one of the WSB, the WSB orbit, the low energy transfer and the weak capture, a Kepler energy of the at least one of a space vehicle, satellite and rocket is slightly negative and substantially near to zero.

Claim 50: (new) A method according to claim 46, wherein the at least one of the WSB, the WSB orbit, the low energy transfer and the weak capture is realizable at the predetermined arbitrary altitude by specifying a predetermined velocity magnitude of the at least one of a space vehicle, satellite and rocket, thereby defining a predetermined capture eccentricity.

Claim 51: (new) A method according to claim 38, wherein the forward targeting process is a Newton algorithm.

Claim 52: (new) A method according to claim 38, wherein the first heavenly body or the first heavenly body orbit comprises earth or earth orbit, and wherein the second heavenly body or the second heavenly body orbit comprises moon or moon orbit.